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Blazar Proper Motions Homan et al.
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Parsec-Scale Blazar Monitoring: Proper Motions

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abstract We present proper motions obtained from a dual frequency, six-epoch, VLBA polarization experiment monitoring a sample of 12 blazars. The observations were made at 15 GHz and 22 GHz at bi-monthly intervals over 1996. Ten of the eleven sources for which proper motion could be reliably determined are superluminal. Only J2005+77 has no superluminal components. Three sources (OJ 287, $J1224+21, and J1512\text{-}09) show motion faster than 10 h^{-1}$c, requiring $\gamma_{pattern}$ of at least $10h^{-1}$ ($H_0 = 100h$ km s^{-1} Mpc^{-1}). We compare our results to those in the literature and find motions outside the previously observed range for four sources. While some jet components exhibit significant non-radial motion, most motion is radial. In at least two sources there are components moving radially at significantly different structural position angles. In five of six sources (3C 120, $J1224+21, 3C 273, 3C 279, J1512\text{-}09, and J1927+73) that have multiple components with measurable proper motion, the innermost component is significantly slower than the other frequency VLBI data spanning several epochs.$